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ABSTRACT

This final report describes activities and findings of a project which examined computer-automated scheduling in institutions for higher education and secondary schools and selected two sources for scheduling systems products which it recommends to institutions in the member states of the Midwestern Higher Education Commission and members of the North Central Association of Colleges and Secondary Schools. It notes that automated systems can achieve significant administrative and cost efficiencies, but most are financially unattainable. The project selected two companies--Universal Algorithms and Applied Business Technologies--after a comprehensive review of available products and services over an 18-month period of research and inquiry. Submitted software was assessed for functional requirements, service expectations, and financial parameters for academic scheduling and management software in higher and secondary education. Negotiation of special pricing was accomplished to bring computer aided course scheduling on a variety of platforms within the financial reach of virtually all member institutions. Appendixes include detailed product information, survey results, and a copy of the original Request For Proposal. (Author/NAV)

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ED 394 407

MIDWESTERN HIGHER EDUCATION COMMISSION

Academic Scheduling and Management Software Program

Final Report and Recommendations

Prepared for Institutions of Higher Education and State Agencies in MHEC Member States: Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin

MHEC Academic Software Committee

February 1996

HE 029 101

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The Midwestern Higher Education Commission (MHEC) was established in 1991 by the Midwestern Regional Higher Education Compact, an interstate agreement among Midwestern states. The current members of MHEC are Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin.

The mission of MHEC is to improve higher education opportunities and services in the Midwest region thorough interstate cooperation and resource sharing. MHEC programs include activities to:

- Enhance productivity through reductions in administrative costs
- Encourage student access, completion and affordability
- Facilitate public policy analysis and information exchange
- Promote regional academic cooperation
- Encourage quality educational programs and services
- Encourage innovation in the delivery of educational services

MHEC
Advancing Education Through Cooperation

Midwestern Higher Education Commission
1300 South Second Street, Suite 130
Minneapolis, MN 55454–1015
Office: 612/626–8288
FAX: 612/626–8290
E-mail: <mhec@maroon.tc.umn.edu>
WWW: http://www.umn.edu/mhec/

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MHEC
Advancing Education Through Cooperation

February 1, 1996

Higher Education Leadership
MHEC Member States

Dear Colleagues:

I am very pleased to present the following report on academic scheduling and management software for your consideration. This report was prepared by the MHEC Academic Software Committee following eighteen months of research and inquiry. It provides important information on functional requirements, service expectations and financial parameters for academic scheduling and management software in higher education. The Committee members are:

The Committee has recommended two nationally recognized software companies for institutional consideration in acquiring scheduling systems products: *Universal Algorithms* and *Applied Business Technologies*. These firms were selected after a comprehensive review of academic scheduling software products and services. Both companies demonstrated excellent quality and value in their respective products, integrity in their corporate practices and strong commitments to servicing the needs of institutions in MHEC states. The special pricing offered under this program brings computer aided course scheduling on a variety of platforms within the financial reach of virtually all institutions in MHEC states.

The Commission is very appreciative of the Academic Software Committee's excellent work in bringing this project to a successful conclusion, and extends special acknowledgment and thanks to the following Committee members who directed the assessment process: Sam Hill, Kerry Adams, John Bingham, Alan Hileman, Susan LaMore, Dennis Linster, and Tom McCuistion. We are confident that, after reading this report, you will share our enthusiasm for their accomplishments.

We believe that this program will benefit many colleges and universities in our member states, and would appreciate receiving your comments regarding its value. We look forward to hearing from you.

Sincerely,

David Murphy
President

Midwestern Higher Education Commission
1300 South Second Street, Suite 130 • Minneapolis, Minnesota 55454-1015
E-MAIL: MHEC@maroon.tc.umn.edu • Fax: (612) 626-8290 • Telephone: (612) 626-8288

MIDWESTERN HIGHER EDUCATION COMMISSION

Academic Scheduling and Management Software Program

Final Report and Recommendations

- Background
- Evaluation Process
- Findings and Recommendations

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MHEC Academic Scheduling and Management Software Program

Final Report

February 1996

Background

Academic scheduling: The scheduling cycle faced by academic institutions includes three patterned and information-intensive phases: the planning of course offerings and events; the assignment of instructors and course functions to facilities, resources and timeslots; and the ongoing modification of schedules in adjustment to new needs (for example, enrollment shifts). These processes are formidable challenges to the college or university that lacks a computer-aided scheduling system.

Automating these processes can help achieve significant administrative efficiencies. Unfortunately, at many institutions in the Midwest, scheduling processes are incompletely automated. Although sophisticated scheduling packages are available in today's market, most are too costly to afford, for small institutions in particular, or are available only as components of comprehensive student information systems.

MHEC involvement: The Academic Scheduling and Management Software (SAMS) Program developed from roundtable sessions on computer-aided course scheduling at the 1992 and 1994 annual meetings of the North Central Association of Colleges and Secondary Schools. The first of these sessions attracted representation from 32 colleges and universities. Discussion revealed serious concerns about under-utilization of modern tools. Cost and functionality appropriate to smaller institutions were two barriers identified. In follow-up discussions, institutional representatives encouraged MHEC to become involved in the development of a regional market remedy.

To assess interest, MHEC convened a second roundtable discussion in conjunction with the March 1994 meeting of NCA. At this session participants unanimously agreed that the identified problem merited a solution-oriented investigation. As a result of this meeting, an ad hoc group of volunteers prepared and submitted a planning proposal to MHEC. The proposal emphasized the administrative efficiencies that could be derived from the implementation of modern computer-aided scheduling and the cost barriers to greater diffusion of the technology. The proposal was approved by the Commission at its May 1994 meeting and a Scheduling Software Planning Committee (later re-named the Academic Software Committee) was formed.

The Committee: The MHEC Academic Software Committee was convened to investigate the course scheduling needs of Midwestern institutions and the availability of systems packages embodying requisite functionalities. The Committee's findings and recommendations are submitted to MHEC for implementation, and then made available to all public and private, non-profit institutions of post-secondary education and state agencies in MHEC member states. The Committee is composed of academic affairs and administrative computing officers representing campuses throughout the MHEC region. Members are:

Sam Hill, Chairman *
Kankakee Community College, IL

Dale Ewen
Parkland College, IL

Tim Daniels
Independence Community College, KS

Sr. Barbara Sellers
Saint Mary College, KS

Susan Johnson Cox
Bay Mills Community College, MI

Alan Hileman *
Monroe County Community College, MI

Jim Ahrens
Wentworth Military Academy, MO

Dennis Linster *
Wayne State College, NE

Thomas McCuistion *
Clark State Community College, OH

Teresa Halcsik
Bellin College of Nursing, WI

Len Vanden Boom
Milwaukee School of Engineering, WI

John Bingham *
Mid-State Technical College, WI

David Murphy, Ex Officio *
MHEC

Phillip Sirotkin, Ex Officio *
MHEC

Todd Graham, Ex Officio *
MHEC

Kerry Adams, Consultant to the Committee *
Kankakee Community College, IL

Susan LaMore, Consultant to the Committee *
Kankakee Community College, IL

John LaCourse, Consultant to the Committee
Bay Mills Community College, MI

* denotes member of the Assessment Subcommittee, appointed to meet as proxy for the Committee-of-the-Whole

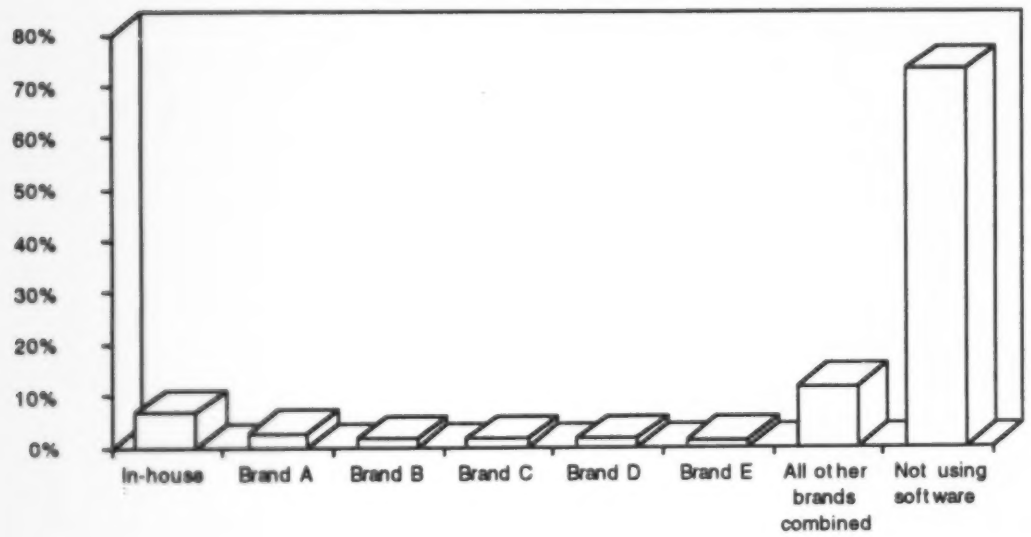
The Academic Scheduling and Management Software (SAMS) Program: Over the past two years, the work of the Academic Software Committee has progressed from investigation to proactive program development. As a direct result, MHEC has finalized agreements with two excellent firms to provide services and systems purchase opportunities to interested colleges, universities and school districts in MHEC member states. By special arrangement, the scheduling systems products recommended by the Academic Software Committee will be offered to eligible institutions at specially negotiated prices. *(See Appendices 1 and 2 for MHEC program agreements.)*

The SAMS Program was conceived to make available superior quality scheduling systems satisfying the budgetary constraints and breadth of functional requirements found across the education market. It is our expectation that the recommended products, offered through the SAMS Program, will bring computer-aided scheduling within the financial reach of virtually all institutions — small as well as large — in MHEC member states.

Evaluation Process

Preliminary analysis: The Academic Software Committee began its work by surveying hundreds of Midwestern institutions to identify systems packages in use, required and desired functions, and cost requirements. The survey was distributed during the Summer of 1994 to institutions with less than 10,000 students; 264 responses (61 percent of initial sample) were received.

1994 Scheduling Software Usage
for MHEC Sample (n=264)



In analyzing responses, MHEC found that only 27 percent (±3 percent) of institutions surveyed used software of any sort for scheduling. Although sophisticated scheduling packages are available in today's market, most were identified as too costly. Of responding institutions, 79 percent indicated that they would be at least "somewhat interested" in the possibility of purchasing systems packages priced below $5,000; 39 percent indicated interest in packages priced above $5,000. It was determined that the smallest institutions, typically having minimal administrative

computing, would be the most difficult to serve. These and other survey findings of systems needs and preferences were instrumental in developing specifications for the SAMS Program. *(See Appendix 3 for a copy of the survey findings release.)*

Request for Proposals: In February 1995, the MHEC Academic Software Committee issued a Request for Proposals (RFP) to administrative software companies throughout the nation and asked for their written responses. The objective of the RFP was to identify vendors with proposals contributing to solution of the course scheduling challenge. The RFP contained systems design and capabilities criteria, a user support requirement, and a request for a vendor history statement. In all, ten firms responded to this request. *(See Appendix 4 for a copy of the RFP.)*

In anticipation of intensive deliberations and negotiations, an Assessment Subcommittee was appointed to meet as proxy for the Committee-of-the-Whole. Three proposals judged to appropriately address the SAMS Program RFP were taken up by this Subcommittee at its first review conference. This conference took place in Chicago on May 9 and 10, 1995. Selected vendors were invited to meet with the Subcommittee, to present their proposals and demonstrate their developed products, if available. Two other proposals emerging from the original pool of respondents were reviewed at later dates during the Summer of 1995. Again, selected vendors met with the Subcommittee, in Chicago and by teleconference.

Pursuant to the objective of engaging appropriate partner vendors, the Assessment Subcommittee resolved at its first meeting that vendors and their products should surmount three hurdles to be recommended for MHEC endorsement.

1. **Satisfactory evaluation of systems (or proposed systems) packages with respect to the design and capabilities criteria detailed in the RFP:** These design and capabilities criteria were discussed in-depth at meetings in the Spring of 1995. The Committee affirmed that any eventual endorsement of a scheduling package must be based, in part, on demonstration that the package merits adoption and use. Taken as a whole, the Committee's criteria may be viewed as derivative of three issues or questions broadly applicable to information systems:
   (a) efficiency – how well does proposed scheduling system optimize assignments?
   (b) functionality – does it provide the tools needed?
   (c) user control – how adaptable is it to institutional needs?

2. **Satisfactory evaluation of vendor history and reputation, ability to deliver (proposed) systems, and commitment to customer service and user support:** Together these factors were considered predictive of vendor appropriateness. Information systems sophistication cannot be presumed ubiquitous across all campuses. This point in mind, the Committee expressed its concern that a provider–customer relationship should include provisions for implementation support and user training, avenues for product use consultation, documentation provision, and availability of product upgrades and

enhancements. In discussion with prospective partner vendors, and in review of vendor history and references, the Committee worked to confirm that vendors shared this vision of the provider–customer relationship.

3. **Satisfactory potential for delivering net benefit to Midwestern educational institutions — beyond what could be delivered without MHEC involvement:** Through intensive negotiations over the final months of the RFP-and-review process, the Committee challenged prospective partner vendors *and MHEC itself* to develop a cooperative program to offer the region opportunities better than those afforded by the open market. From the outset, the Committee requested:

   (a) guaranteed program availability to institutions in MHEC member states;

   (b) preferential pricing on scheduling systems packages;

   (c) cooperation in developing and implementing a joint marketing and support services strategy;

   (d) program oversight by a committee comprised of representatives from participating institutions;

   (e) sharing reports, between each vendor and MHEC, of inquiries by and sales to eligible institutions;

   (f) cooperation in program-related research and information efforts; and

   (g) a one-year agreement with renewable options for additional years.

Evaluation process outcomes: Between May and November 1995, the Committee discussed proposals with several vendors. Proposals that were evaluated as unfeasible or that went far beyond course scheduling were tabled or dismissed. Of those that remained, the Committee determined that two best satisfied its requirements as detailed above. Meeting in Chicago on October 26, 1995 and by teleconference on November 29, 1995, the Committee voted to recommend that MHEC conclude program agreements with Universal Algorithms, Inc. (UAI) and Applied Business Technologies, Inc. (ABT).

UAI will participate in the SAMS Program by making its line of scheduling systems packages, for a variety of platforms, available to Midwestern institutions at significantly reduced prices. ABT will participate by introducing in the Midwest, at specially negotiated prices, a Windows-platform scheduling package developed using specifications derived from the SAMS Program RFP. The Committee expects that the offerings of the SAMS Program will bring computer-aided scheduling on a variety of platforms within the financial reach of virtually all institutions in MHEC member states.

After receiving final information from the vendors and testing ABT's scheduler prototype, the Committee met by teleconference on January 23, 1996, and issued the following findings and recommendations.

Findings and Recommendations

1. **The MHEC Academic Software Committee finds that applying modern information systems technology to course and resource scheduling processes can help institutions achieve significant administrative efficiencies.**

   Modern computer-aided scheduling systems offer such advantages as: (a) optimization of resource and facility assignments, resulting in a more efficient use of people and space; (b) online inquiries and booking capabilities to support the scheduling of non-academic events and activities; and (c) streamlined administrative access to space usage data, facilitating the forecasting of physical plant needs.

2. **The Committee encourages decision-makers at institutions in need of computer-aided scheduling systems to consider the issues identified by officers at peer institutions as a starting point in reviewing options.**

   The system design and capabilities issues below were the chief issues developed from responses to MHEC's course scheduling survey. These were subsequently used as design and capabilities criteria in the SAMS Program RFP. These identified issues are suggestive of the exploration that is pre-requisite to system selection at the institutional level.

Table 1. Design and capabilities issues

• Efficient handling of inputs?	Does scheduler optimize matching of course functions to rooms and timeslots?
• User-defined scheduling parameters?	Can the scheduler's routines be adapted, where necessary, to campus conventions?
• System adaptable to campus needs?	Can users depart from default settings, create new variables, etc.?
• Course variables capture desired information?	e.g. course and section identifiers, enrollment limits, specified instructors, room or building preferred, room type or room features required
• Faculty variables capture desired information?	e.g. sections taught, total enrollment projection, contact hours, updated time commitments

• Room/facility variables capture desired information?	e.g. location identifiers, room type, room capacity, off-line time blocks, updated time commitments
• Faculty assignment parameters reflect necessary constraints?	Does the scheduling run process account for designated instructors' time constraints to limit the range of assigned responsibilities?
• Room location/features cataloguing?	Does the scheduling run optimize assignments to accommodate courses according to declared course requirements?
• Master room scheduling capabilities?	Does it permit template assignment of courses and events with annually (or quarterly) recurring needs?
• Priority status through a priority status variable?	Does the system allow authorized users to assign priority, as desired, to certain room choices and instructors?
• Conflict checking and resolution?	While maximizing room and timeslot preferences, etc., does it eliminate double bookings and other conflicts?
• Override capacity?	Can rooms be assigned to events manually? Conflicts resolved on-line?
• Department/program specific course offerings audits and special coding options?	Does the system allow users to model availability of required courses on a program by program basis?
• Sample student schedules?	Can sample student schedules be generated on a program by program basis?
• Logical relation of scheduling to other information systems databases in place on campus?	Can the schedulers outputs be fed into student registration system and other systems used on campus?
• Schedule adjustment routine?	Can 11th-hour adjustments be made to account for actual course enrollments, other changes?
• Multiple calendars?	Can it accommodate concurrent as well as sequential calendars?
• Permits scheduling of events/ activities outside the academic course schedule?	Does it permit users to meet the needs of auxiliary events? To do on-line room availability inquiry and facilities booking?
• User-friendly operation?	Can users move easily between command interfaces, data display windows, query windows, etc.?

• Query/analysis on choice of variables?	Does the scheduler enable use of the scheduling database for specialized analyses?
• Report generation?	Are commonly needed, customizable report templates bundled with the scheduler?
• Import/export conversion from/to formats common to campus?	e.g. ASCII, common database and spreadsheet formats, formats used by other info systems on campus
• Networkable?	Does it permit concurrent use of scheduling data at different work stations?
• Security measures?	Are security and authorization protocols included, beyond that already in place on campus?
• Choice of platform?	e.g. DEC Alpha, IBM RS6000, Pentium PC , etc.

3. **The Committee finds that scheduling systems options available on the market in 1994–95 did not fully satisfy the budgetary constraints and breadth of functional requirements found across the Midwestern higher education community.**

MHEC found in 1994 that only 27 percent (±3 percent) of institutions surveyed used software of some sort for scheduling. At the time, the majority of respondents had not identified scheduling systems appropriate in function and price to their respective campuses.

The Committee finds that niche market characteristics pose obstacles to a higher rate of computer-aided scheduling utilization: (a) Although sophisticated scheduling packages are available, most are too costly for small institutions to afford. (b) The market has been slow to deliver satisfactory PC-based scheduling packages. (c) Other schedulers are available only as module components of comprehensive student information systems. (d) However, not all SIS packages include a scheduler, leaving a number of institutions in need of a separately sold package. The Committee has designed the Academic Scheduling and Management Software Program in response to these obstacles.

4. **Based on its research and evaluation, the Committee reports that Applied Business Technologies' IQ.Session scheduler and the line of scheduling products available from Universal Algorithms — SCHEDULE25, MODEL25, and 25E — offer scheduling features that satisfy the systems design and capabilities criteria set forth by the Committee.**

The Committee enumerated design and capabilities criteria in its SAMS Program RFP. The two products identified above provide options responsive to these criteria; they are judged to merit adoption and use. (It should be noted that the exploration of scheduling systems issues encouraged in item 2 of these findings is modelled after the review undertaken by the Committee. Still, specific functionality and platform requirements vary, compelling prospective adopters to undertake tailored assessments of appropriateness.)

Table 2. Satisfaction of ASC's design and capabilities criteria

	UAI Schedule 25	*ABT IQ.Session*
• Efficient handling of inputs?	✔	✔
• User-defined scheduling parameters?	✔ using S25E	✔
• System adaptable to campus needs?	✔	✔
• Course variables capture desired information?	✔	✔
• Faculty variables capture desired information?	S25E may be adaptable	✔
• Room/facility variables capture desired information?	✔	✔
• Faculty assignment parameters reflect necessary constraints?	S25E may be adaptable	✔
• Room location/features cataloguing?	✔	✔
• Master room scheduling capabilities?	✔	✔
• Priority status through a priority status variable?	✔	✔

	UAI Schedule 25	*ABT IQ.Session*
• Conflict checking and resolution?	✔	✔
• Override capacity?	✔ using S25E	✔
• Department/program specific course offerings audits and special coding options?	—	—
• Sample student schedules?	—	—
• Logical relation of scheduling to other information systems databases in place on campus?	✔	✔ programming adaptable
• Schedule adjustment routine?	✔ using S25E	✔
• Multiple calendars?	✔	✔
• Permits scheduling of events/ activities outside the academic course schedule?	✔ using S25E	✔
• User-friendly operation?	✔	✔
• Query/analysis on choice of variables?	✔ using S25E	✔
• Report generation?	✔	✔
• Import/export conversion from/to formats common to campus?	✔ programming adaptable	✔ programming adaptable
• Networkable?	✔	✔
• Security measures?	✔	✔
• Choice of platform?	IBM Mainframe, IBM R/6000, HP, Sun, DG/UX, Vax, DEC Alpha, Sequent, etc.	PC-based (Mac version in 1998?)

In considering products that satisfied its design and capabilities criteria, the Committee further compared vendor history and reputation, ability to deliver (proposed) systems, commitment to customer service and user support, and potential for delivering net benefit to Midwestern institutions.

Table 3. Satisfaction of ASC's vendor criteria

	UAI Schedule 25	*ABT IQ.Session*
• Demonstrated commitment to customer service and user support?	✔	✔
• Vendor history & reputation?	✔	✔

5. **The MHEC Academic Software Committee recommends the following companies for institutional consideration in the selection, according to institutional needs, of scheduling systems products:**

   Universal Algorithms, Inc. for SCHEDULE25, MODEL25, and 25E

   Applied Business Technologies, Inc. for IQ.Session

   In a series of assessment meetings over a period of six months (May to November 1995), the Committee selected Universal Algorithms and Applied Business Technologies as its vendors of choice to recommend to Midwestern educational institutions. In their written responses and presentations to the Committee, UAI and ABT have demonstrated the integrity of their companies and the commitment of their product development, sales, and service teams to meet the needs and expectations of higher education in MHEC states.

6. **To simplify scheduling system selection and acquisition, MHEC has developed with Universal Algorithms and Applied Business Technologies a cooperative program — the SAMS Program — to offer regional acquisition opportunities better than those afforded by the open market.**

   UAI and ABT have met the assessment criteria, pricing goals, and service commitments sought by the MHEC Academic Software Committee in its Request for Proposals (February 1995). Each has agreed to offer all 501(c)3 colleges and universities, public school systems, and state agencies in MHEC member states extremely competitive software package pricing, as well as training, implementation and service options, under the provisions of umbrella agreements with MHEC. *(See Appendices 1 and 2 for product descriptions and special MHEC pricing.)*

Further Information

For further information regarding the contents of this report, its findings and recommendations on scheduling systems, and/or details of the Academic Scheduling and Management Software (SAMS) Program, interested institutions, school systems and state agencies should contact MHEC headquarters or the recommended partner vendors directly.

MHEC Headquarters

David Murphy
Midwestern Higher Education Commission
1300 South Second Street, Suite 130
Minneapolis, MN 55454
phone: 612/626–8288
e-mail: <mhec@maroon.tc.umn.edu>

Recommended Vendors

Applied Business Technologies, Inc.
ATTN: Tiffany Parry
4631 West Chester Pike
Newtown Square, PA 19073
phone: 800/220–2281
e-mail: <info@abtcampus.com>

Universal Algorithms, Inc.
ATTN: Matt Critchett
200 SW Market, Suite 1590
Portland, OR 97201
phone: 503/973–5200
e-mail: <matt@unival.com>

Appendix 1

MIDWESTERN HIGHER EDUCATION COMMISSION

Product Information from Universal Algorithms

The following provisions and pricing for systems licensure, user training opportunities, and customer support are being made available to all public and private [501(c)3] institutions of post-secondary education, public school systems, and state agencies in MHEC member states through a joint agreement between the Midwestern Higher Education Commission and Universal Algorithms, Inc. The effective date of this agreement is January 1, 1996.

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UAI Software Program

(A MHEC endorsed software solution)

As part of the MHEC SAMS Program, Universal Algorithms, Inc. is offering its software at a progressively discounted rate based on the number of MHEC member institutions that participate in the program. Discounts from UAI's Basic Fee Schedule range from 4 percent to 55 percent of the base price.

UAI Discounts

Basic Fee Discount: See Table.
Annual Fee Discount: Total Annual Fee to equal 11% of the original Basic Fee *(before discounts)* when 11 or more institutions participate.
Service Fee: Total Service Fee to equal 3% of the *discounted* Basic Fee, payable to MHEC.

Discount Qualification

License agreements must be signed and returned no later than July 31, 1996, to ensure qualification. MHEC will tally the number of participating schools to determine the final discount rate.

UAI Basic Fee Discount Table

Number of schools	Percent Discount	Number of schools	Percent Discount	Number of schools	Percent Discount	Number of schools	Percent Discount
2	4	9	32	16	45	23	52
3	8	10	36	17	46	24	53
4	12	11	40	18	47	25	54
5	16	12	41	19	48	26+	55
6	20	13	42	20	49		
7	24	14	43	21	50		
8	28	15	44	22	51		

Product Descriptions/Technical Specifications/UAI Client Services

The following pages outline information regarding the UAI software products available to MHEC institutions as well as technical specifications to aid in determining hardware and operating system requirements. Included in UAI's information packet is other literature regarding the extended services and customer support UAI has to offer.

(Specific information regarding software pricing can be found in the Universal Algorithms Information Packet, or can be obtained by calling Universal Algorithms at 503-973-5200.)

One SW Columbia, Suite 100 Portland, OR 97258
phone -503/973-5200 - fax - 503/973-5252
email - damon@unival.com

Product Summary

UAI's software applications are built for colleges and universities. SCHEDULE25 and 25E can function independently, but usually are licensed together as a complete space-management solution. MODEL25 and SCHEDULE25 work in tandem, as do 25E and the View Module. UAI products are designed to interface with and augment student information systems.

- **SCHEDULE25 -** An automatic, bulk classroom scheduling software system that places courses into rooms using a unique optimization algorithm. This algorithm maximizes the number of classes placed and the percentage of seats filled, while considering room characteristics, class size, and departments' location preferences. SCHEDULE25 tests thousands of placement scenarios and optimizes room assignments in seconds.

- **MODEL25 -** Provides advanced graphic modeling capabilities that help you quickly and easily visualize and plan the use of campus space. Users can point and click to build and review graphs and tables of classroom supply versus demand, station utilization, and timespread. Each scenario is run instantly through SCHEDULE25's space optimization algorithm and graphically compared to earlier models using color PostScript™ graphics. (Requires SCHEDULE25.)

- **25E -** A multi-user, on-line scheduling system that quickly determines suitable space for one-at-a-time bookings of both academic and non-academic events. SCHEDULE25 course placement information can be fed directly into 25E and becomes the starting database for all other campus scheduling. 25E is an outstanding information source for administrators, faculty, students, maintenance personnel, and campus visitors. 25E's extensive report generating capabilities help administrators track campus space management, answering questions such as, "How is each department spreading out its course times?" "What is the room utilization rate on Tuesday morning versus Friday afternoon?" and "How often are facilities rented to off-campus groups?"

- **25E View Module -** The 25E View Module is popular among schools that want to distribute facility and event information. It provides unlimited view-only access to all 25E information. (Requires 25E.)

Technical Specifications

SCHEDULE25, 25E, and MODEL25

Hardware and Operating Systems

Hardware	SCHEDULE25	25E	MODEL25
Data General	DG/UX	DG/UX	—
DEC Alpha	OSF	OSF	—
DEC Station	Ultrix	Ultrix	—
DEC VAX	VMS	VMS	—
Hewlett-Packard 3000	MPE/XL	—	—
	MPE/iX	MPE/iX	—
Hewlett-Packard	HP/UX	HP/UX	—
IBM Mainframe and compatibles	MVS, VSE, VM	—	—
IBM RS/6000	AIX	AIX	AIX
Sequent	DYNIX	DYNIX	—
	DYNIX/ptx	DYNIX/ptx	—
Sun	Sun OS	Sun OS	—

Other Requirements

CPU Memory: SCHEDULE25: 1/2 Mb per run per 250 rooms being scheduled; 25E: 1 Mb for the executable files. (Final configuration dependent upon number of clients.)

Disk Space: SCHEDULE25 and 25E together require approximately 30 Mb of disk space for each calendar year of data. MODEL25 requires about 4 Mb of disk space.

Terminals: SCHEDULE25 and 25E: VT terminal emulation access via PCs, Macintoshes, X-terminals or dumb terminals. MODEL25: AIX 3.2.5 or above, with Motif 1.2., X11 R5.

Records: Systems are initialized in flat ASCII files.

User Community

Auburn University
Auckland Institute of Technology
Auraria Higher Education Ctr
Baltimore County CC District
- 3 campuses

Barton County CC
Berklee College of Music
Boise State University
Boston College
Bridgewater State College
Brigham Young University - Hawaii
Broome CC
Brown University
Burlington County CC
California State University,
- Fresno
- Humboldt

Carleton University
Carnegie Mellon University
The Catholic University of America
Chaffey College
Clackamas CC
Claremont Graduate School
Clark Atlanta University
Clayton State College
City University of New York
- 18 campuses

College of DuPage
College of Lake County
The College of William and Mary
Columbia University
Columbia-Greene CC
Community College of Rhode Island
Cornell University
Dallas County CC District
- 7 campuses

Dartmouth College
Delta College
Dickinson College
Drexel University
Duke University
Duquesne University
East Tennessee State University
Eastern Washington University
Fairleigh Dickinson University
Fitchburg State College
Florida Atlantic University
Florida State University
Foothill-DeAnza College
Franklin University
Gallaudet University
George Mason University
George Washington University
Georgia Institute of Technology
Georgia Southern University
Georgia State University
Grant MacEwan CC
Hahnemann University
Hocking College
Hofstra University
Howard CC
Indiana University of Pennsylvania
Iowa State University
Kenyon College
Lansing CC
Laramie County CC
Lima Technical College
Lincoln Land CC
Long Island University
Louisiana State University
Loyola College
Mankato State University
McGill University
Mercer University
Miami-Dade CC
Middle Tennessee State University
Milwaukee Area Technical College
Mount Holyoke College
Mount Royal College
Nassau CC
New Jersey Institute of Technology
New York University
North Carolina State University
Northeast Louisiana University
Northeastern University
North Harris/Montgomery CC District
- 4 colleges

North Idaho College
The Ohio State University
Pacific Lutheran University
Plymouth State College
Portland CC
Portland State University
Radford University
Riverside CC District
Rockland CC
Roger Williams University
Sacred Heart University
Saint Louis University
San Francisco State University
Scripps College
Sierra College
Sinclair CC
Southeastern Louisiana University
St. Olaf College
Stanford University
State Technical Institute at Memphis
State University of New York,
- Albany
- Binghamton
- Buffalo
- College at Buffalo
- New Paltz
- Stony Brook

Syracuse University
Tennessee State University
Texas A&M
Tufts University
University of Akron
University of Alabama at Birmingham
University of Alaska,
- Anchorage
- Fairbanks
- Matanuska-Susitna

University of Arizona
University of Auckland
University of California,
- Davis
- Irvine
- Riverside
- San Diego
- Santa Cruz

University of Central Florida
University of Colorado,
- Boulder
- Colorado Springs
- Denver

University of Denver
University of the District of Columbia
University of Georgia
University of Hawaii
University of Hong Kong
University of Idaho
University of Illinois
- Champaign-Urbana
- Chicago

University of Lethbridge
University of Louisville
University of Maine
University of Massachusetts,
- Amherst

University of Memphis
University of Michigan
University of Minnesota,
- Duluth
- Morris
- Twin Cities

University of New Orleans
University of North Carolina,
- Chapel Hill
- Wilmington

University of Northern Colorado
University of Portland
University of San Diego
University of San Francisco
University of Saskatchewan
University of South Florida
University of Southern Mississippi
University of Toledo
University of Utah
University of Virginia
University of Washington
University of Western Ontario
University of Winnipeg
University of Wisconsin
- Stout

Utah State University
Utah Valley State College
Victoria University of Wellington
Virginia Polytechnic Institute
Volunteer State CC
Washington State CC System
- 18 campuses

Washington University
Waukesha County Technical College
Wayne County CC
West Virginia University
Western Michigan University
Western Washington University
Wharton School
York University

CONDITIONAL COMMITMENT

The undersigned institution has reviewed the attached licensing agreement with Universal Algorithms Inc.

The undersigned agrees that it will sign the licensing agreement and license the products specified below PROVIDED THAT THE BASIC FEE FOR THE APPLICABLE PRODUCT IS DISCOUNTED BY AT LEAST _____ PERCENTAGE.

If the Basic Fee is not discounted by at least the rate specified in the previous paragraph, the undersigned is not bound by the licensing agreement.

Product:_____

Institution

By:(Signature):_____
Name:(Print):_____
Title:(Print):_____

Print Name of the Institution:_____

Appendix 2

MIDWESTERN HIGHER EDUCATION COMMISSION

Product Information from Applied Business Technologies

The following provisions and pricing for systems purchase, user training opportunities, and customer support are being made available to all public and private [501(c)3] institutions of post-secondary education, public school systems, and state agencies in MHEC member states through a joint agreement between the Midwestern Higher Education Commission and Applied Business Technologies, Inc. The effective date of this agreement is January 1, 1996.

It's About Time...

IQ.Session is a campus resource scheduler for institutions of higher education. Developed using Visual Basic and Microsoft Access, IQ.Session is designed as an economical software solution to the course scheduling and space planning problems faced by colleges and universities.

Eliminate Manual and Redundant Data Entry

Many schools manage campus resources and events through manual, paper calendars and layouts. IQ.Session replaces this mode of work with electronic means. Class schedules are *automatically* created with optimal use of space and facilities.

Consolidate Multiple Data Bases or Paper Sources

The IQ.Session data base includes information on rooms, courses, your academic calendar and faculty preferences. Information may be directly entered or imported from your existing administrative system. Using the import process saves you valuable data entry time and gives you the benefit of having all resource information in one place.

Schedule Resources Efficiently, With a Personal Touch

Trying to please every faculty member while scheduling classes is a time consuming task. IQ.Session automates this process by enabling you to record faculty preferences. These preferences are taken into account when the scheduler does its work. The scheduler optimizes your use of space by using room and building attributes along with course requirements and faculty preferences.

Establish Work Processes Your Way

IQ.Session allows you to define code tables and work processes your way. Through the use of code tables, you define room and building attributes according to your facilities needs.

Highlights

Course Management
- Course ID, department, title and full description
- Schedule priority and room type
- Start/end dates
- Minimum/Maximum and actual enrollment
- Hours/week and course status
- Teaching assignments, with multiple instructors
- Course Section requirements, including priority level assigned to each and quantity needed
- Course attributes

Employee Management
- Name, title, department, campus address, phone, e-mail address
- Employee teaching assignments
- Requirements, including priority assigned to each and quantity needed

Facility Management
- Picture of campus, building, floor and room
- Building attributes
- Number of floors, rooms and notes
- Room type, department, room attributes
- Schedule priority for rooms, floors and buildings

Built-In Navigator
- Menu tree lists entry options in easy to read format
- Options roll up into list mode, using plain English
- Built for novice and advanced users
- Faster than traditional pull down menus

Pipelines to Main Database

- Includes built-in pipeline to existing database for courses with faculty assignments, course/room requirements, faculty preferences, department requirements, building and room attributes
- Pipeline can be off-line or on-line
- Movement of changes can be automated between IQ.Session and other modules

Master Schedule with Optimization

- Enables visual picture of room assignments
- Drag and drop to adjust time blocks
- Enables what-if processing as priorities change
- Bulk course/room assignment
- Exception handling
- Conflict resolution allows manual adjustment of priority and optimization order to reduce conflicts
- Allows ad-hoc event assignments

Built-In Navigator

ABT's Navigator helps you find the data entry screens you need to enter information quickly. Built for both novice and advanced users, the Navigator is faster than traditional pull down menus.

Course Management

Course catalog information may be entered directly into the system or imported from your existing administrative tables. Once imported, you have the ability to add scheduling priorities and free form notes. The scheduling priority is used by the optimizer to ensure high priority classes are scheduled first.

Employee Management

The Employee tables hold the campus office information, as well as current teaching assignments and requirements for scheduling. The requirements table allows you to tailor your schedules to faculty preferences.

Facility Management

The Facility tables manage the campus, building, floor and room data. This data is used by the optimization process to build the most efficient schedule possible for your institution. Attributes are assigned to floors and rooms according to your code table setup. These attributes are then used to match a facility with an event on campus. IQ.Session also allows you to display pictures of the facilities on campus.

Pipelines to your Main Database

After entering basic code table information, the Pipeline program will import data from your existing administrative system into IQ.Session. After the Optimizer completes the schedule process, information may be piped back out to the existing system. Once the pipeline is established, the movement of changes is automated, eliminating redundant data entry between modules.

Master Schedule Grid with Optimization

The Master Grid is the heart of the scheduling system. It enables you to visualize the room or employee assignments. Drag and drop with the mouse to adjust time blocks, move events within or between days and to schedule new events.

Report Options

Standard reports are provided with IQ.Session, including the Utilization report. Shown in graphical form, this report will display percentage of utilization for any room on campus on any day of the year. Schedule reports are provided, allowing you to print room and course schedules.

View Only Access

Information held by the system can be made available to others with network access to IQ.Session. This is view-only access and no changes to the calendar may be made by these users.

Support and Service Information

ABT provides telephone support for IQ.Session on our toll free 800 support line. Users may call our IQ support staff directly for assistance on installation, implementation or other "how to" questions. New clients are given an allowance of help desk support according to the number of seats licensed with the original order. Hours expire one year after purchase date of product.

Number of Concurrent Users of Licensed System	Help Desk Allowance
1	4 hours
5	6 hours
10	6 hours
20	10 hours
50	18 hours
Unlimited	20 hours

Technical Information

Minimum Hardware Requirements

Pentium 100
30 Mb Free Disk Space
16 Mb Memory
Super VGA Monitor

Software Requirements

Windows 3.1

Pricing Information

Single Campus Pricing

Please refer to the Order form for special MHEC pricing.

Multi-Campus Pricing

The first campus license will be priced at the MHEC special rate as listed above. Each additional campus, in a multi-campus environment will receive a 10% discount from the MHEC published price.

Pricing expires on December 1, 1996.

Ordering IQ.Session

Fax, e-mail, or phone in your order form with payment to obtain your copy of IQ.Session. ABT offers a 30 day money back guarantee on the IQ.Session product.

Please use the order form on the back page of this brochure.

Questions may be directed to:
Tiffany Parry 1-800-220-2281 x136
or e-mail at info@abtcampus.com

ABT's Mission

To help Colleges and Universities attain their objectives and goals by providing innovative systems that can easily be tailored to the unique needs of their administrative environments.

ABT Product Line

ABT offers a range of administrative tools for the higher education market. Below is a brief description of each product family.

IQ.Exec

IQ.Exec is developed to sit on the desk of the President of the institution. IQ.Exec integrates disparate data from multiple sources into meaningful information. The information is displayed in either numeric or graphical form.

IQ.AHEC

IQ.AHEC is developed for health care professional institutions to track life experiences and clinical rotations in light of federal guidelines for Area Health Education Centers.

PowerCAMPUS

The PowerCAMPUS family of administrative management products includes PC.Records, PC.Billing, PC.Advisor and PC.Admissions. These modules reflect a reengineering trend in the higher education market towards decentralized, innovative management procedures.

ABT CAMPUS for SQL

The ABT CAMPUS product offers an integrated approach to managing administrative offices. A full suite of application modules from Inquiry to Alumni, including Business Office and Financial Aid is available.

Gain a Competitive Advantage

We designed the ABT systems to help colleges and universities gain a competitive edge. With the ABT system, your institution will be fully prepared to recruit more students, raise more money, and retain more students by providing better, more efficient services.

Flexibility

ABT systems are entirely table-driven, allowing users to tailor the various areas of the system to meet their needs. It is also SQL-compliant, providing unmatched flexibility and expandability.
Microsoft Solutions Provider
As a Solutions Provider, ABT joins Microsoft in the continual challenge of embracing new technology and applying it to everyday business solutions.

Evolution

ABT offers a growth path unparalleled in the industry. By taking advantage of PC networks, ABT has left room for your institution to grow and evolve with technology. As the only major administrative software company with an operational, installed MS Windows product, ABT anticipates and takes advantage of the latest technological trends.

People/Client Services

The people who provide ABT's client services are our greatest asset. We offer services to meet every client & user need including:

- HelpDesk (telephone support hotline)
- Operational Support & On-Site Consulting
- Training Classes
- Data Conversion Services
- Full Documentation
- On-line, context-sensitive Windows Help
- Quarterly Newsletter

Applied Business Technologies, Inc.
4631 West Chester Pike
Newtown Square, PA 19073
1-800-220-2281

Call ABT or visit our Home Page for additional information and terms and conditions.
http://www.abtcampus.com

Order Form

IQ.Session

Enterprise-Wide Automated Scheduling

Bill To:

Ship To:

DESCRIPTION			UNIT PR	TOTAL
IQ.Session Software Package				
Check the number of users:				
	1	☐	$995.00	
	2 - 5	☐	$ 1,700.00	
	6 - 10	☐	$ 2,600.00	
	11 - 20	☐	$ 4,500.00	
	Over 20	Number of users: _____	$ 1,000 per user	
A 3% Service Charge will be added to all MHEC Member Institutions.				

BAL DUE

Appendix 3

MIDWESTERN HIGHER EDUCATION COMMISSION

MHEC Academic Scheduling Software Survey Results

Midwestern Higher Education Commission
Academic Software Committee
Research Bulletin

Volume 1, Number 1 *February 1995*

MHEC Academic Scheduling Software Survey Results

Institutional survey identifies academic scheduling software benchmarks.

The academic scheduling cycle faced by higher education institutions includes three general processes. These processes are patterned and information-intensive: (1) the planning of course offerings; (2) the assignment of instructors and course functions to facilities and timeslots; and (3) modifications of schedules to meet enrollment shifts and variance in facility needs. Automating these proceses can help small colleges achieve significant administrative efficiencies, thereby conserving time and resources.

Thanks to the cooperation of 264 small and medium sized colleges and universities surveyed in 1994, the Midwestern Higher Education Commission has assembled benchmarks that may assist higher education institutions in assessing computer-supported academic scheduling options.

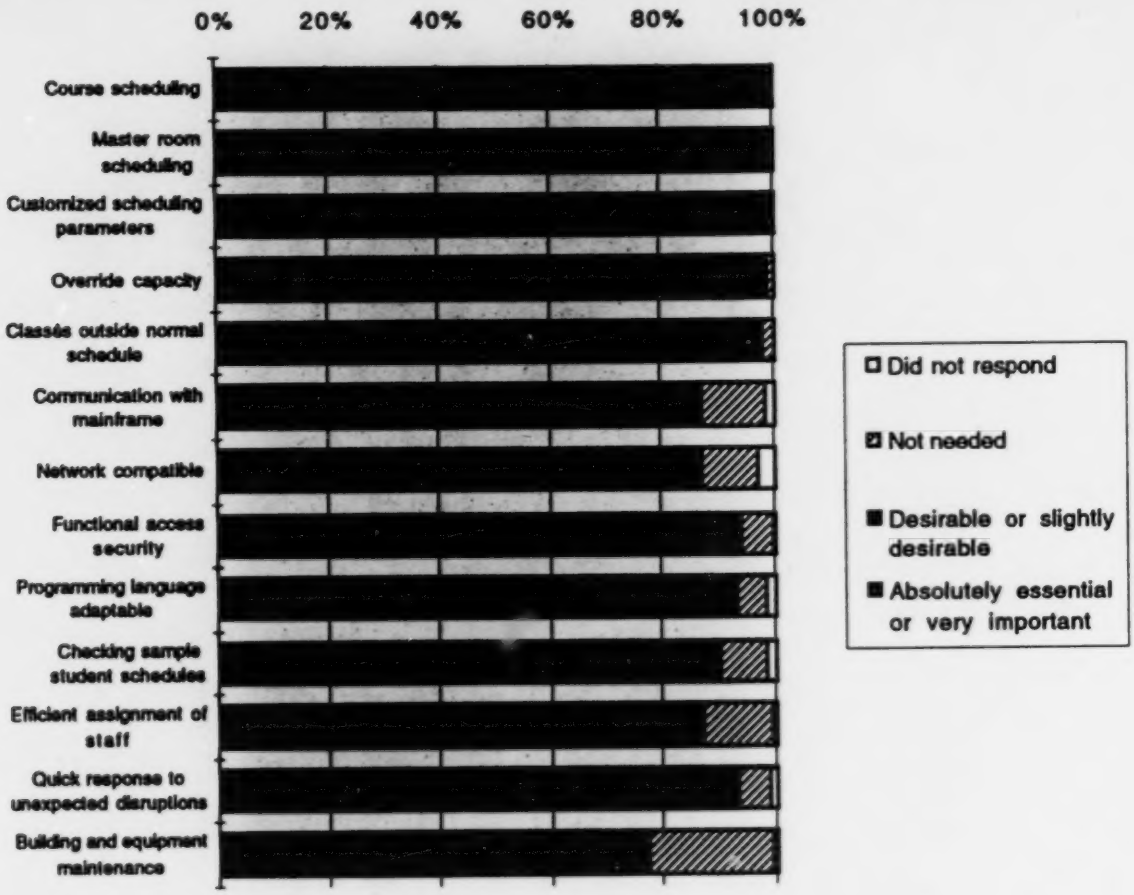
Data collected from the survey were instrumental in developing software specifications adopted for MHEC's Academic Scheduling and Management Software Project.

The chief quantitative findings of the survey are summarized in this bulletin. Included are data on features desired, software platform preferences, pricing preferences, and current use of scheduling software.

Survey Facts

- 432 surveys were mailed to MHEC member institutions with less than 10,000 students; 264 institutions (61 percent) responded.
- Median enrollment at these institutions is slightly less than 2,000 students. Mean enrollment exceeds 4,500.
- The survey focuses on four main areas: scheduling software capabilities, platform preferences, cost parameters, and software currently in use, if any.

Significance of Scheduling Software Capabilities



Demand for Platform Compatibility

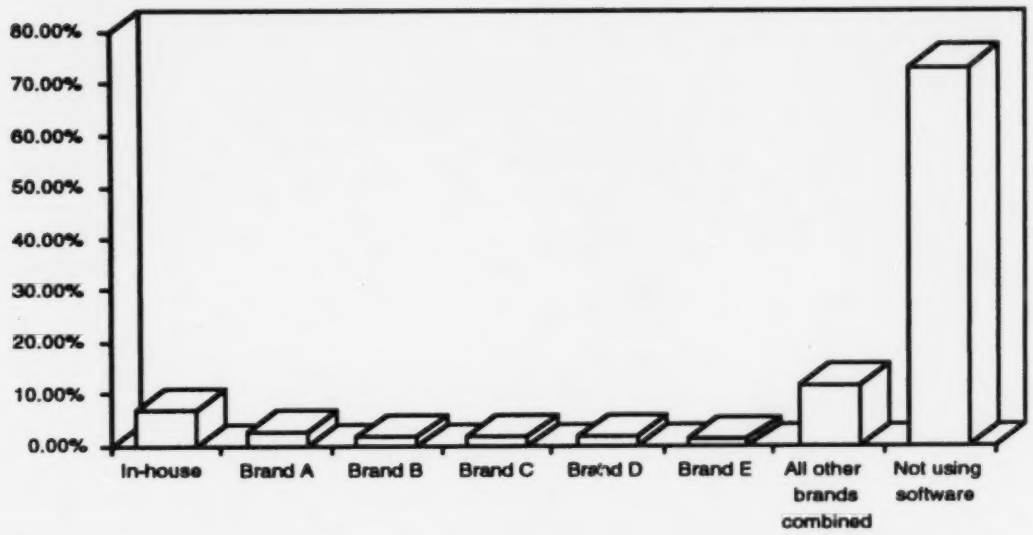
72% of institutions judged PC compatibility "absolutely essential" or "very important."

Nearly half of these (33%) gave like priority to Mac and/or UNIX compatibility as well.

Only 9% gave priority to Mac or UNIX exclusively.

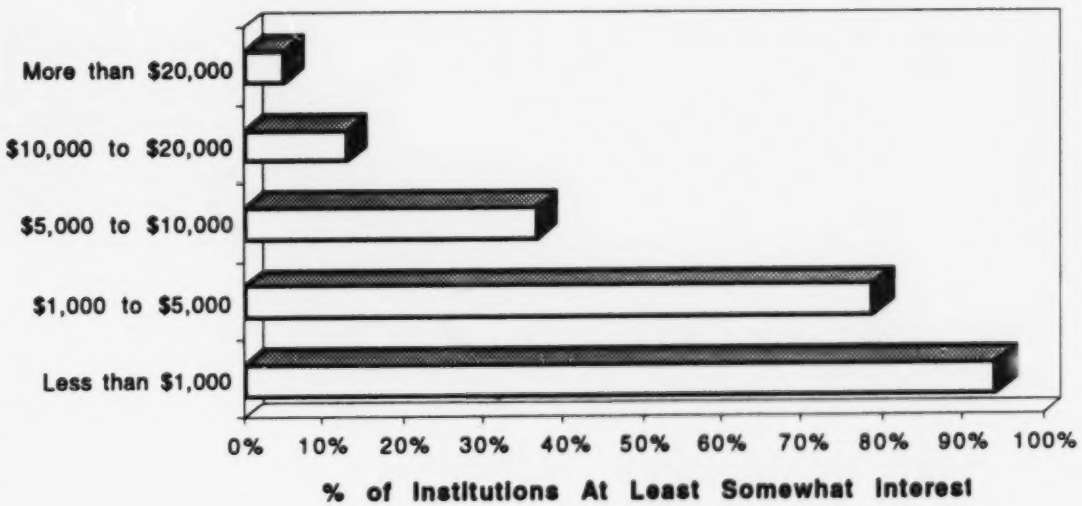
● = 100%

Current Software Usage for Surveyed Institutions



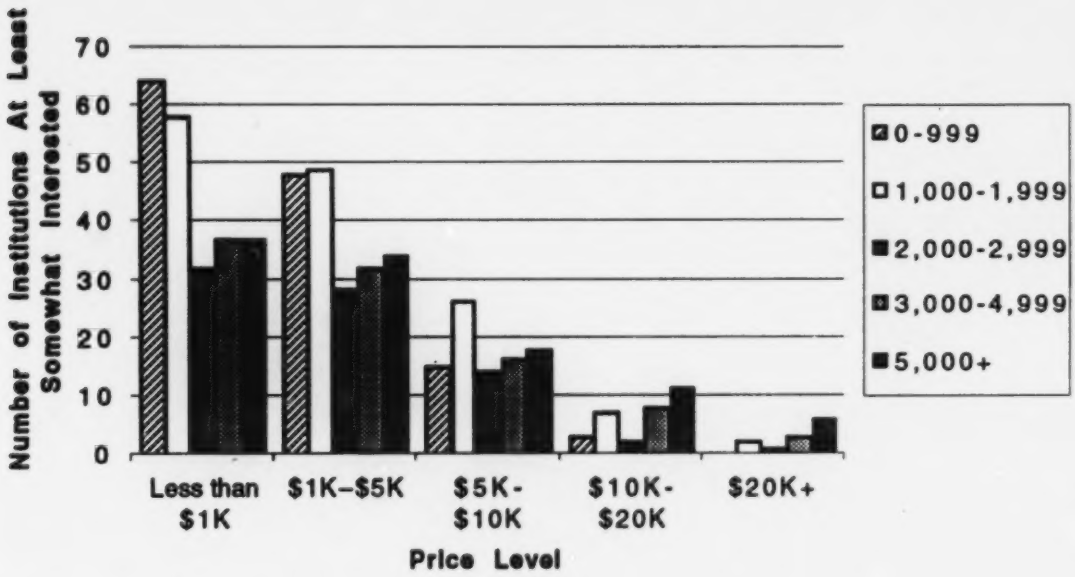
At many small colleges in the Midwest, scheduling processes are incompletely automated, if they are automated at all. MHEC has found that *less than 30 percent* of small colleges currently use software of some sort for scheduling. Cost is the major barrier. Although many sophisticated scheduling packages are available in today's market, most are too costly for small institutions to afford.

Anticipated Demand for Software by Price Level



As seen above, MHEC found considerably more demand for scheduling software at lower prices. Below $5,000, 79 percent of responding institutions were at least "somewhat interested." Approximately 39 percent indicated interest in the possibility of purchasing packages in the $5,000–$10,000 range and only 13 percent in the $10,000–$20,000 range.

Anticipated Demand for Software by Institution Size



About the MHEC Academic Software Committee

The Academic Software Committee (ASC) was convened in March 1994 by MHEC to address the course scheduling needs of small and medium-sized institutions. At present, the Committee is seeking to make programmatically available scheduling software that is scaled to the requirements and budget constraints of the small college market. Through a Request For Proposals (to be released this winter), the Committee wishes to identify vendors that are willing to provide such software at affordable pricing to all interested institutions in MHEC member states.

Acknowledgments

MHEC expresses its gratitude to Mr. Jeff Dykehouse and Mr. Todd Graham for their efforts in analyzing survey results and in assembling this report.

The Midwestern Higher Education Commission (MHEC) was established in 1991 by the Midwestern Regional Education Compact, an interstate agreement among midwestern states. The current member states include Illinois, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin. The mission of MHEC is to improve higher education opportunities and services in the midwest region though interstate cooperation and resource sharing. Programs include activities to produce regional cost savings to benefit colleges and universities, expand student access, support public policy development through analysis and information exchange, facilitate regional cooperative academic programming, encourage quality management, and promote economic growth through higher education and industry innovation.

For additional information, please feel free to call us at
612/626-8288

Appendix 4

MIDWESTERN HIGHER EDUCATION COMMISSION

MHEC Academic Scheduling and Management Software Request for Proposals (RFP)

BEST COPY AVAILABLE

MHEC

ADVANCING EDUCATION THROUGH COOPERATION

REQUEST FOR PROPOSALS

for the

ACADEMIC SCHEDULING AND MANAGEMENT SOFTWARE PROJECT

Prepared by the

Midwestern Higher Education Commission
Academic Software Committee

February 1995

MIDWESTERN HIGHER EDUCATION COMMISSION

ACADEMIC SOFTWARE COMMITTEE

The Academic Software Committee was created in March 1994 by the Midwestern Higher Education Commission. Its charge is to facilitate the development of an academic scheduling and facilities management software program to serve the unique needs of small and medium sized institutions. The project was initiated in response to numerous requests from both the public and the independent sectors of midwestern higher education. It is primarily intended to benefit the 432 college, university and community college campuses in MHEC member states with less than 10,000 students and 200 classrooms respectively; however, it will be available to all 800 plus public and private non-profit postsecondary education institutions, consortia, and/or systems including colleges, universities, community colleges, technical colleges and associated not-for profit institutions such as service agencies, and foundations having affiliated interests in the instruction, research and service missions of eligible institutions in MHEC member states.

REQUEST FOR INFORMATION

The purpose of this RFP is to gather information on potential software solutions to meet the scheduling challenges faced by small colleges, universities, community colleges and technical colleges in the midwest. A needs-responsive, low-cost scheduling software package will enable small institutions to achieve administrative efficiencies by automating the patterned, information-intensive processes of course scheduling, thereby conserving time and resources. MHEC seeks to engage a reputable and responsible software provider capable of delivering such needs-responsive, low-cost software pursuant to the requirements set forth in this RFP and the recommendations of the Academic Software Committee.

MHEC has determined that developing a small college market for academic scheduling and facilities management software through a programmatic arrangement will benefit both the higher education community and its designated software provider(s). The RFP-and-review process is intended to culminate in purchase options that higher education institutions need as consumers. Consequently, it affords software providers--commercial vendors as well as institutions with "home-grown" solutions--a truly competitive opportunity to advance product recognition and penetrate a new market. MHEC estimates that more than 300 midwestern institutions are currently uncommitted to any software product for these purposes.

PROJECT OBJECTIVE

The objective of the Academic Scheduling and Management Software Project is to make available a superior quality, needs-responsive scheduling software package scaled to the scheduling requirements and budgetary constraints of smaller institutions in MHEC member states. The Academic Software Committee is committed to facilitating the development of a software package of superior value in terms of delivering *the needed capabilities* at *affordable pricing*. This pricing must be available regionwide to all institutions and state agencies in MHEC member states.

SPECIFICATION OF SOFTWARE DESIGN AND CAPABILITIES

In preparing this RFP, the Committee surveyed 264 institutions to identify the features, specifications and capabilities sought in a scheduling software package. The information on the following pages is based on the results of that survey as well as on the combined knowledge, experience and insights of the Committee. The survey responses indicate a substantial consensus within the higher education community on basic system capabilities sought. **Proposed scheduling solutions submitted in response to this RFP will be evaluated according to the following needs and specifications:**

1. **Efficient handling of inputs**: How effectively courses are matched with times, rooms and instructors is a major concern of academic planners. Scheduling software processes should implement this matching conveniently and efficiently.

2. **User-defined scheduling parameters**: At the same time, the system should also allow user control of scheduling routines. Users should be able to reorder, customize and/or opt out of the routines programmed into the system--for example, allowing users to match courses with timeslots before rooms...or vice versa.

3. **System adaptable to institutional needs**: Specifically, the system should achieve flexibility by accommodating:
   - departure from default settings and customization of settings
   - creation of program routines needed by an institution
   - inclusion of user-created data variables and constants
   - decentralized or centralized management systems

4. **Course inputs**: The successful assignment of time and space requires that the scheduling system efficiently handles course information stored in a data file created for the scheduling process and relate it to data files containing pertinent faculty and facility information. Course inputs should include:
   - *course and section identifiers*
   - *multiple section indicator*
   - *enrollment limit*
   - *instructor specified* and a list of *designated staff* (available for multiple section courses or as alternates for single section courses)
   - *number of rooms/facilities required*

For each room required by a given course section, a set of fields should accommodate the following information:
   - *room preferred* or *campus area/building preferred*
   - *room type required* (e.g. art studio, seminar room, physics lab)
   - *room features required* (e.g. computer hook-ups, a film screen, equipment); and
   - *number of hours/week* room is needed

5. **Faculty inputs**: The scheduling system should relate the above course data to a file of instructor information, matching faculty assignments in such areas as:
   - *course preparations, sections taught*, and *total enrollment projection*†
   - *classroom hours and other course-related hours* (e.g. lab hours)
   - *time commitments due to class*• and *other times unavailable*

---

† As instructors are matched to courses, the software should update course load data.

• As courses, instructors, rooms and timeslots are matched to one another, the software should update *scheduled time commitments* data for the appropriate instructor records and room records.

6. Room/facility inputs: Course data should also be related to a file containing a permanent catalogue of room/facility information. Course requirements and preferences will be matchedwith the following elements:

- *location identifiers*;
- *room type* (e.g. art studio, seminar room, physics lab);
- *room capacity* as well as a check list of other *room features*;
- *off-line time blocks* (times when building or room is closed); and
- *previously scheduled time commitments* (i.e. reserved timeslots).

7. Faculty assignment parameters: The scheduling system should account for instructors' time constraints and subsequently maximize assignment of courses to *instructor specified* or *designated staff* by limiting the range of potential timeslots in which courses could be placed.

Because the system will be adaptable to institutional needs, it will enable efficient, centralized management and bench marking of faculty workloads (for example, a college could conceivably devise a formulaic treatment of *sections taught, total enrollment projection, classroom hours,* etc. and could compare the formula result to institutionally defined constants representing maximum and minimum workload).

8. Room location/features cataloguing: The scheduling system should work to accommodate courses according to declared course requirements (e.g. matching courses and rooms on *room type* and *room features* and testing for *room capacity* $\geq$ *course enrollment limit*); then consider schedule alternatives which maximize the number of courses assigned with *room preferred* matching optimized. The system should also respond effectively to courses with "break-out sessions" or multiple room needs (e.g. labs, small group recitations, etc.).

9. Master room scheduling: The system should allow institutions the option of permanent assignment of timeslots and locations for certain courses, activities or events as institutions see appropriate.

10. Priority status: Related to master room scheduling, system options available to schedulers should include the assignment of course priority status (i.e., assign timeslots, rooms and instructors to highest priority courses first), through a numeric *priority status* variable.

11. Conflict checking and resolution: The variables mentioned above suggest the parameters for delimiting potential matches in the appropriation of rooms and timeslots. The system should also employ these variables in checking for conflicts (e.g. multiple courses and/or events scheduled by rooms and/or instructors) and should work to eliminate conflicts while maximizing the satisfaction of timeslot preferences, room preferences, etc. Strategies for conflict checking and resolution might include the programming of conflict guard variables and an audit protocol that allows users to resolve residual conflicts on-line.

12. Override capacity: Through a data display/manual editing window, authorized system users should be able to accomplish the following:

- resolve conflicts on-line
- "manually" assign rooms, timeslots or instructors to courses
- otherwise reserve timeslots for facilities

13. Student progress, eligibility audit: Many academic programs include a core of mandatory or sequenced courses. Accommodating program structures should then require (a) that timeslot assignments not pose conflicts for students, and (b) that course sequencing conform to prerequisite requirements. These demands might be satisfied by coding course records with a *complementary course* variable and a *prerequisites* variable and designing a student progress/eligibility audit protocol.

14. Sample student schedules: The system should enable the generation of sample student schedules to be reviewed by schedulers and academic department staff as a check to the student progress/eligibility audit. These schedules should also be available on-line for review by students.

15. Relation of course scheduling data to registration data: Importantly, variables such as course meeting times and enrollment limits must be movable from scheduling to registration databases. Then also, the system should permit users to load registration outputs back into the course scheduling process.

16. Schedule adjustment routine: The scheduling system should be able to relate *actual course enrollment* from an institution's student registration process back to the course scheduling system for the purpose of refining and modifying preliminary matches between courses and rooms. For example, based on course enrollments, courses with high or low enrollment/room capacity ratios might be reassigned.

17. Multiple calendars: The system should allow users to run concurrent calendars as well as sequential calendars; to plan preliminary schedules for multiple future quarters or semesters; and to develop exam schedules and other special short-term schedules.

18. Scheduling of events and activities outside normal schedule: The system should feature on-line **room availability inquiry** and **facilities booking** to support the general scheduling of nonacademic events and activities. Also, it should enable improved coordination with building security and maintenance as these functions can be scheduled through the same process.

19. User friendly operation: Schedulers should be able to move easily, with little delay between:

- procedural windows
- data display/manual editing windows for all data files
- query/analysis windows
- output windows
- report design windows.

The system should present users with easy-to-learn and use menu-driven interfaces. For Windows or Mac, interfaces should employ pull-down menus, point-and-click operations, etc.; for DOS or UNIX, intuitive design of menus and on-screen function key summaries.

20. Query/analysis on choice of variables: The system should enable users to conduct specialized on-line analyses with *all* course, instructor, room and schedule output data available: e.g. instructor credit loads, room utilization expressed in hours/week, average class sizes, and room use by timeslot. Also, query/analysis protocols should facilitate "clean and easy" **cross listing and cross reading** of the data elements pertinent to course scheduling.

21. Report generation: Software packages should include, pre-installed, the most commonly needed report templates, specifically those for the generation of:

- instructor schedule including office hours
- sample student schedules
- course time and location schedules for students
- room availability schedules and utilization analyses

Institutions would also like users to have the flexibility to create and edit **user-defined/ customized report templates** that draw on the full range of variables and that will accurately depict the report template on screen.

22. Import/export conversion for a variety of formats: Institutions indicated interest in the ability to import and export data to and from:

- other scheduling system formats (e.g. Colleague, Schedule 25/25E, SCT, etc.)
- common database and spreadsheet formats (e.g. Lotus, Excel, Paradox, etc.)
- ASCII tab-delimited and space-delimited

23. Networkable and mainframe compatibility: The system should be amenable to stand-alone use but also enable users to share master files in a networked environment. It should also allow users to access data from a mainframe (VAX, Sun, etc.) and to transfer a copy of output data back onto the mainframe. This is especially crucial since most campuses today have moved to on-line course registration of students.

24. Security measures: Functional access of the system, input data and output data will normally be restricted to authorized personnel with varying user privilege levels. Authorization and security protocols should be a part of the scheduling system.

25. Choice of platform: It will be to the benefit of both the supplier and the market to develop software versions for the major platforms used by colleges and universities. In its survey, MHEC found that half of all respondents gave higher significance ratings to PC compatibility than to Mac or UNIX compatibility, but that choice of platform was still highly valued. Indeed, one-third gave "essential" and "very important" ratings to compatibility on two or three platforms.**

26. User support: Finally, institutions indicated strong interest in finding a vendor prepared to provide training, manuals and self-training accessories, "hotline" trouble-shooting service, and other system provider services.

27. Vendor Capabilities: The Committee believes that past performance history, software experience and capabilities to service a comprehensive program to all eligible institutions and agencies in MHEC states is an important consideration. Proposals should include information on these items and listings of client references.

** 25% evaluated both PC and UNIX compatibility as "essential" or "very important"; both PC and Mac, 15%; 7% gave high priority to all three and so are double counted.

RFP PROCESS

RFP Submission Requirements

Vendors intending to respond to this Request For Proposals should fill out the Intent to Respond Form (Attachment A) and FAX or mail it to MHEC's Minneapolis office prior to **March 1, 1995**. The deadline for submission of proposals and related information is **April 4, 1995**. Twenty (20) copies of each vendor response should be forwarded to the following address prior to the April 4, 19956 deadline:

Midwestern Higher Education Commission
ATTN: Dr. Sam Hill, Chair
Academic Software Committee
1300 South Second Street, Suite 130
Minneapolis, MN 55454-1015
Phone: (612) 626-8288
Fax: (612) 626-8290

Analysis of Information

All responses to this RFP will be analyzed by the MHEC Academic Software Committee. The analysis will be based on the proposed packages' provision of the system capabilities set forth in this RFP. The findings and recommendations of the MHEC Academic Software Committee will be submitted to the Commission for approval. Members of the Committee are:

Sam Hill, *Chair*

Dale Ewen, Illinois
Tim Daniels, Kansas
Sister Barbara Sellers, Kansas
Susan Johnson Cox, Michigan
Alan Hileman, Michigan
Jim Ahrens, Missouri
Dennis Linster, Nebraska
Thomas McCuistion, Ohio
John Bingham, Wisconsin
Teresa Halcsik, Wisconsin
Len Vanden Boom, Wisconsin
David Murphy, MHEC, *Ex Officio*
Todd Graham, MHEC, *Ex Officio*
Phillip Sirotkin, MHEC, *Ex Officio*

Kerry Adams, Illinois, *Consultant*
Susan LaMore, Illinois, *Consultant*
John LaCourse, Michigan, *Consultatn*

Vendor Selection

All proposed software solutions received from respondents by April 4, 1995 will be reviewed by the Committee. Materials and proposals received in response to this RFP will be forwarded to each Committee member, and will be treated as proprietary information. Three to six finalists will be selected by the Committee based upon its assessment of the quality and comprehensiveness of the responses to the requirements set forth in the RFP as well as its assessment of the respondents' performance history, experience, and capabilities to service the program to MHEC institutions. Finalists will be invited to make a formal presentation to the Committee. Following that presentation each finalist will be asked to submit a best and final proposal. The Committee will review each finalist's best and final proposal, and submit its findings and recommendations to the Commission. Respondents to the RFP will be notified of the final selection upon completion of an agreement. The Commission reserves the right to reject any or all proposals at its own discretion

Purchase Statement

As previously stated, the objective of this project is to facilitate institutional acquisitions of cost effective scheduling systems. The vendor(s) selected to implement the project will be recommended by MHEC to institutions in MHEC member states. MHEC does not act as the central purchasing agent. **Each individual member institution or system will enter into a purchase/license agreement with the vendor(s) in accordance with their respective purchasing policies.**

Endorsement of Vendor(s)

The Academic Software Committee will recommend specific endorsements to the Commission. Upon approval, MHEC will assist in introducing the endorsed software system to its membership, and in developing communications mechanisms to facilitate successful project implementation and evolution over the term of the agreement.